

# NOTES ON SOME ECHINODERMS FROM MARION ISLAND

By F. W. E. ROWE & A. M. CLARK

THE specimens which form the basis of the present report were collected at Marion Island in the Southern Ocean (approx. 47° S, 37° E) by Mr A. F. de Villiers during the 1972/73 South African Expedition sponsored by the Department of Transport at Pretoria and sent to the British Museum for identification.

Marion and the adjacent Prince Edward Islands were the subject of another South African expedition in 1965/66, the holothurians from which were reported on by Pawson and the other echinoderms by Bernasconi in 1971. Both these authors remark on the zoogeographical affinities of the fauna with that of Kerguelen to the east and the sub-Antarctic Falkland-Magellan area further away to the west.

The single species of holothurian taken is discussed here by F. W. E. Rowe and the remaining echinoderms by A. M. Clark.

## HOLOTHURIOIDEA

### *Pseudocnus laevigatus* (Verrill)

*Pentactella laevigata* Verrill, 1876 : 68.

*Cucumaria serrata* var. *marionensis* Théel, 1886 : 74-75, pl. 4, fig. 3.

*Cucumaria laevigata* : Ekman, 1927 : 396-403, fig. 15.

*Pseudocnus laevigatus* : Pawson, 1968 : 145, figs 2-11 ; 1971 : 288-289.

MATERIAL TVLT 7 and 28, under boulders at the sub-littoral fringe and at 4 m ; 4 specimens.

LD 11, undersides of stones at LWS ; 7 specimens.

Z 9, undersides of holdfasts of the bull kelp *Durvillea antarctica* at LWN ; 2 specimens.

Z 32, in a 'lithothamnion'-filled depression at LWS ; 6 specimens.

The size of the specimens ranges from length : breadth 8 : 3 mm to 60 : 5 mm. The majority are strongly contracted. Their colour varies from white to light pink. The ten tentacles are more or less equal. The density of the spicules of the body wall increases posteriorly. The spicules are more or less cone-shaped, ranging generally from 90 to 120  $\mu\text{m}$   $\times$  50 to 70  $\mu\text{m}$ , though in one specimen (length : breadth 18 : 3 mm) the largest spicules measure 150  $\mu\text{m}$   $\times$  90  $\mu\text{m}$ . The average size is 110  $\mu\text{m}$   $\times$  50  $\mu\text{m}$ . Unfortunately in many cases the spicules have been eroded by initial storage in formalin. However, the complete spicules compare closely with those figured by Pawson (1968) from what he considers to be the type specimen of *Pentactella laevigata* Verrill from Kerguelen, though the present specimens are all much smaller. Similarly, direct comparison of the spicules of these Marion Island specimens with those from syntypes of *Cucumaria serrata* var. *marionensis* Théel in

the British Museum collections: confirms that Ekman (1927) was correct to treat Théel's *C. serrata* with its varieties as conspecific with *P. laevigata* Verrill.

Dissection of several specimens shows that hermaphrodite gonads are present in specimens over 15 mm length (partly contracted), though the egg follicles are empty in the smaller individuals and I doubt whether even the larger specimens are fully mature. No brood pouches are present and only in the largest syntype of *C. serrata* var. *marionensis*, at c. 40 × 9 mm contracted, could I find one.

There are four polian vesicles in these specimens. Verrill (1876) noted three in his specimen and Pawson (1968) found two in specimens from Macquarie Island. I have found two to four in the syntypes of *C. serrata* var. *marionensis*.

## OPHIUROIDEA

### *Amphiura tomentosa* Lyman

*Amphiura tomentosa* Lyman, 1879: 23, pl. 11, figs 299–301; 1882: 132–133, pl. 29, figs 10–12.  
*Nullamphiura marionis* Bernasconi, 1968: 56–58, 2 figs; 1971: 286, pl. 85, fig. 4, pl. 86, fig. 2.

**MATERIAL** Z 25, underside of a stone in a pool connected to the sea by a tunnel; 1 very small specimen.

Z 39, in detritus under boulders at LWS; 2 specimens.

Z 55 (pt), in holdfasts of the giant kelp *Macrocystis pyrifera*; 3 specimens.

Comparison of this material with the holotype of *Amphiura tomentosa* Lyman, collected at Kerguelen by the 'Challenger', shows no significant difference that cannot be attributed to the larger size (d.d. 6.5 mm) of the type, the largest Marion Island specimen at d.d. 3.5 mm being slightly larger than Bernasconi's holotype of *Nullamphiura marionis*. The discrepancies in the published descriptions of the two nominal species, such as the contiguity of the adoral shields (said to be touching in *A. tomentosa* and separate in *N. marionis* – appearing abnormally so in the pair figured by Bernasconi in 1968) are attributable to variation. Indeed Bernasconi (1971) notes that the adorals are 'rarely joined'. The distinctive widely separated radial shields of larger specimens (d.d. 3 mm or more) agree with Bernasconi's and Lyman's descriptions (though in his figures they appear almost contiguous distally). There may also be naked patches of skin in some of the ventral interradii of the present Marion Island specimens as well as in the holotype of *A. tomentosa*. I think that the lack of imbrication in the disc scales of the latter is due to the somewhat distended condition of the disc. The shape of the oral shields is rather variable but they never have such a large proximal angle as in *Amphiura lymani* (Studer) from the vicinity of South Georgia, which is otherwise rather similar, lacking tentacle scales, as Bernasconi notes. Her supposed difference that *A. lymani* has smaller distal oral papillae than proximal (infradental) ones, whereas the reverse is the case in the Marion Island species, is not supported by the present specimens or the 'Discovery' material of *A. lymani* from South Georgia, of which Mortensen's figure (1936, fig. 14, p. 275) is misleading in showing the distal papillae as much smaller

than their true size which I reckon approximately equals the size of the infradental papillae. In the Marion Island specimens the distal papillae are variable not only in size but also in shape, being either pointed or rounded at the tip. The dorsal arm plates have their distal edges flattened medially in these Marion Island specimens and can better be described as fan-shaped than rhombic, as Bernasconi describes them. The ventral arm plates are pentagonal.

As for the generic position of this species, in 1970 I rejected *Nullamphiura* Fell on the grounds that the number of tentacle scales unsupported by other characters is inadequate for a generic distinction from *Amphiura*, being variable in several species and resulting in artificial grouping of otherwise morphologically diverse species (Clark, 1970). In fact, the holotype of *Amphiura tomentosa* does have a few pores showing a rudimentary scale, though these are quite lacking in the smaller Marion Island specimens.

It is surprising that *A. tomentosa* has not been reported again from Kerguelen despite extensive collections by the French and the B.A.N.Z.A.R. Expedition.

### *Ophiurolepis martensi* (Studer)

*Ophioglypha martensi* Studer, 1885 : 161, pl. 2, fig. 8.

*Ophiurolepis martensi* : Mortensen, 1936 : 321-323, fig. 39.

MATERIAL. Z 55 (pt), in holdfasts of the giant kelp *Macrocystis pyrifera* ; 14 specimens.

All these shallow-water specimens as well as 57 others taken by the 'Discovery' Investigations off Marion Island in 88-113 m consistently have the disc plating irregular. In contrast, out of a total of 168 specimens from South Georgia - the type locality - no less than 109 or 65 % have a more or less regular rosette, as Mortensen's figure (1936) shows ; also of 91 specimens from McMurdo Sound in the Ross Sea, 70 % have regular discs. Possibly this difference is enough to justify a sub-specific distinction of the material from the vicinity of Marion Island but there is no obvious morphological difference between them and those specimens from other localities which share their irregular disc plating.

One of these specimens has a number of ? loricates in the grooves between the disc plates.

### *Ophiacantha vivipara* Ljungman

See : Mortensen, 1936 : 246-248, pl. 7, fig. 2.

MATERIAL. Z 57, in the holdfasts of *Macrocystis* (rare) ; 5 adult specimens with several emerging and loose young.

This species was evidently not taken by the 1965/66 expedition, though collected by the 'Discovery' Investigations at 90 or more metres off Marion Island.

## ASTEROIDEA

*Anasterias rupicola* (Verrill)

See: Bernasconi, 1971: 285, pl. 85, figs 1, 5.

MATERIAL. TVLT 14, among boulders at 3.5 m; 6 specimens.

LD 10, in depressions and crevices at LWS; 3 adults with 3 young.

GT 4, on a vertical face at 3 m; 2 specimens.

Z 3, in a rock pool at LWS; 1 specimen.

Z 31, in the pool connected to the sea by a tunnel; 2 specimens.

The largest one of these specimens has R 58–65 mm and exceeds any other record for the species, although one of Bernasconi's had R 49 mm.

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